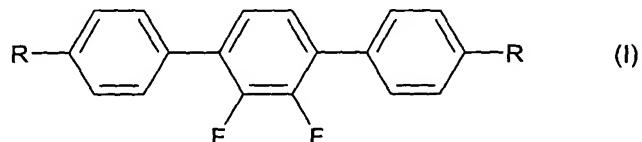


Patent Claims

1. A liquid-crystalline medium having a dielectric anisotropy $\Delta\epsilon$ of ≥ 3 , comprising compounds of formula (I)



10 in which

15 R, independently of one another, are each an alkyl, alkoxy or alkenyl radical having 1-15 or 2-15 carbon atoms respectively, in which one or more CH_2 groups may be replaced by -O- in such a way that oxygen atoms are not adjacent.

2. A liquid-crystalline medium according to Claim 1, comprising:

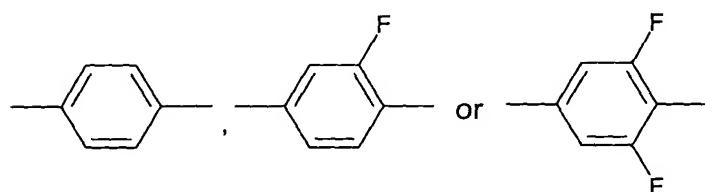
20 a) 1 to 50% by weight of one or more compounds of formula (I);

b) 5 to 90% by weight of one or more compounds of formulae (II) to (V)

25 R - a - b - Z - c - X

in which

30 a, b and c, independently of one another, can be



R is an alkyl, alkoxy or alkenyl radical having from 1 to 15 or 2 to 15 carbon atoms respectively, in which one or more CH_2 groups may be replaced by -O- in such a way that oxygen atoms are not adjacent,

5

X is -F, $-\text{OCF}_3$, $-\text{OCF}_2\text{H}$, -Cl or $-\text{CF}_3$, and

Z is a single bond or $-\text{CH}_2\text{-CH}_2-$;

10

$\text{R} - \text{d} - \text{e} - \text{f} - \text{X}$ (III)

in which

15

d is

20

e is

or

25

f is

and X and R are as defined above;

$\text{R} - \text{e} - \text{f} - \text{X}$ (IV)

30

in which

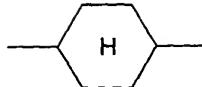
e, f, R and X are as defined above;

35

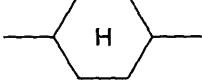
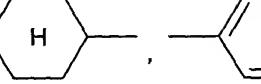
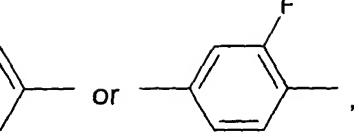
$\text{R} - \text{g} - \text{h} - \text{i} - \text{j} - \text{X}$ (V)

in which

5

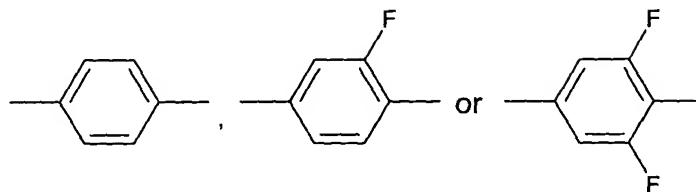
g is 

10

h is  ,  or  ,

15

i and j are each independently



20

and R and X are as defined above;

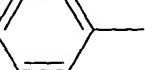
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c) 0 to 30% by weight of one or more compounds of formula (VI)



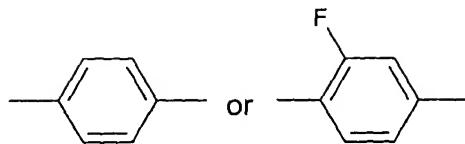
30

in which

k is 

35

l and m, independently of one another, can be



5

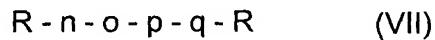
R is as defined above, and

10

R^1 , is -F, -Cl, or an alkyl, alkoxy or alkenyl radical having 1-15 or 2-15 carbon atoms respectively, in which one or more CH_2 groups may be replaced by -O- in such a way that oxygen atoms are not adjacent;

d) 0 to 30% by weight of one or more compounds of formula (VII)

15



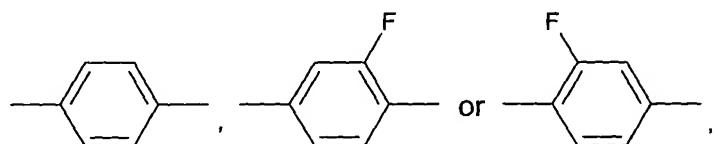
in which

20



o and p are each independently

25



30



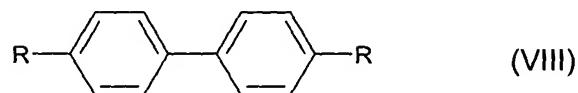
and

35

R are independent of one another and are as defined above; and

e) 0 to 40% by weight of one or more compounds of formulae (VIII), (IX) and/or (X)

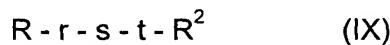
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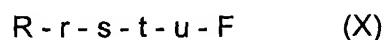
in which

10

R are independent of one another and are as defined above,



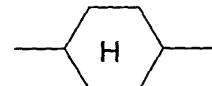
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in which

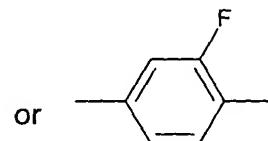
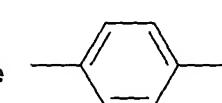
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r and s are each independently



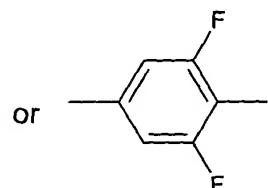
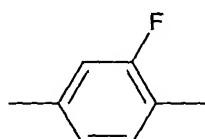
25

t can be



30

u is



R is as defined above, and

35 R², is -F or an alkyl, alkoxy or alkenyl radical having 1-15 or 2-15 carbon atoms respectively, in which one or

more CH_2 groups may be replaced by -O- in such a way that oxygen atoms are not adjacent;

5 where the sum of components a) to e) is 100% by weight.

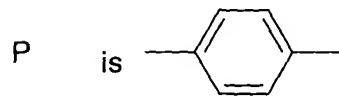
3. A liquid-crystalline medium according to Claim 1 or 2, wherein compounds of formula (II) are selected from the following compounds of (IIa) to (IIg)

10

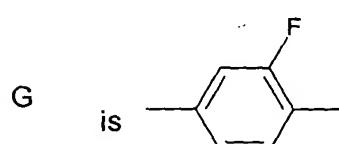
	R - P - G - U - X	(IIa)
	R - P - G - G - X	(IIb)
	R - G - G - G - X	(IIc)
	R - G - G - U - X	(IId)
15	R - G - G - P - X	(IIe)
	R - G - P - G - X	(IIf)
	R - G - P - E - P - X	(IIg)

in which

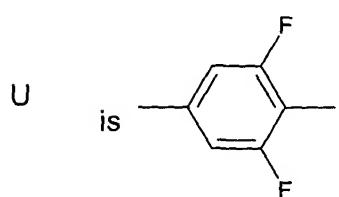
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30



35

4. A liquid-crystalline medium according to one of Claims 1 to 3, wherein compounds of formulae (III) to (V) are selected from the

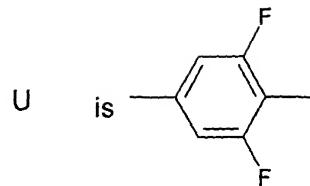
following compounds of formulae (IIIa) to (III f), (IVa) to (IV f) and (Va) to (V d), respectively,

	R - C - P - G - X	(IIIa)
5	R - C - P - U - X	(IIIb)
	R - C - C - G - X	(IIIc)
	R - C - C - U - X	(III d)
	R - C - G - U - X	(III e)
	R - C - G - G - X	(III f)
10		
	R - G - U - X	(IVa)
	R - G - G - X	(IVb)
	R - P - U - X	(IVc)
	R - C - P - X	(IVd)
15	R - C - G - X	(IVe)
	R - C - U - X	(IVf)
	R - C - C - P - U - X	(Va)
	R - C - P - G - U - X	(Vb)
20	R - C - P - G - G - X	(Vc)
	R - C - C - G - U - X	(Vd)

in which

25	C	is		,
	P	is		,
30	G	is		, and

5



10

5. A liquid-crystalline medium according to Claim 3 or 4, wherein, in the formulae (II) to (V),

10

R is an alkyl radical having from 1 to 7 carbon atoms, and

X is -F or -Cl.

15

6. A liquid-crystalline medium according to one of Claims 1 to 5, wherein the compounds of formulae (VI) and (VII) are selected from the following compounds of the (VIa) to (VIc) and (VIIa) to (VIIg), respectively,

20

R - P - GI - GI - F (VIa)

R - P - GI - GI - Cl (VIb)

R - P - G - P - R (VIc)

25

R - C - P - P - C - R (VIIa)

R - C - G - P - C - R (VIIb)

R - C - P - G - P - R (VIIc)

R - C - P - GI - P - R (VIId)

R - C - G - P - P - R (VIIe)

R - C - GI - P - P - R (VIIf)

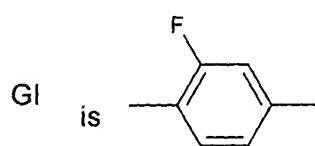
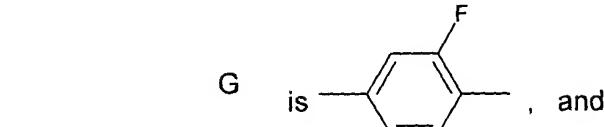
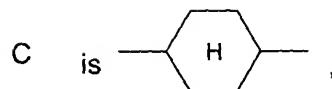
30

R - C - GI - P - C - R (VIIg)

in which

35

R are each independent of one another,



15 7. A liquid-crystalline medium according to Claim 6, wherein R in the
formulae (VI) and (VII) is an alkyl radical having from 1 to 7 carbon
atoms.

20 8. A liquid-crystalline medium according to one of Claims 1 to 7,
comprising

25 a) 1 to 50% by weight of one or more compounds of formula (I),

b) 5 to 90% by weight of one or more compounds of formulae (II)
to (V),

30 c) 0 to 30% by weight of one or more compounds of formula (VI),

d) 0 to 20% by weight of one or more compounds of formula (VII),

e) 0 to 50% by weight of one or more compounds of formulae
(VIII), (IX) and/or (X),

35 where the sum of components a) to e) is 100% by weight.

9. A liquid-crystalline medium according to Claim 8, wherein component b) comprises,

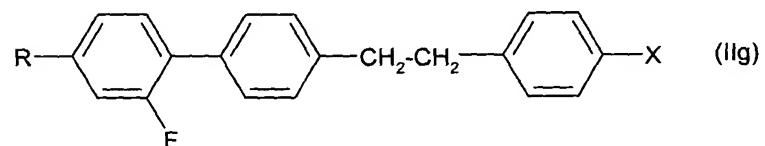
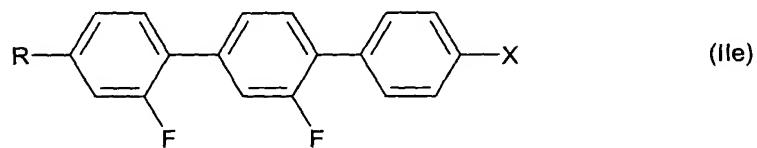
5 b1) 20 to 80% by weight of one or more compounds of formula (II), and

b2) 80 to 20% by weight of one or more compounds of formulae (III) to (V),

10 where the sum of components b1) and b2) is 100% by weight.

10. A liquid-crystalline medium according to one of Claims 1 to 9, comprising

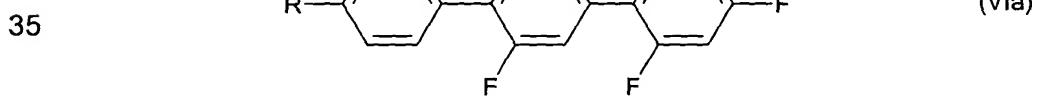
15 i) as compounds of formula (II), compounds of formulae (IIe) and/or (Ilg)



in which

30 R is an alkyl radical having 1-7 carbon atoms, and X is Cl;

ii) as compounds of formula (VI), compounds of the formula (VIa)



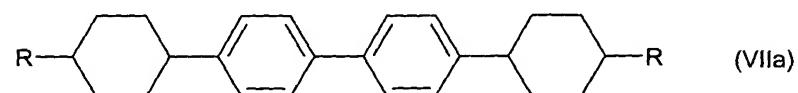
in which

R is an alkyl radical having 1-7 carbon atoms;

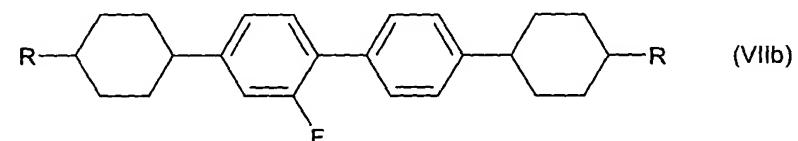
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d) as compounds of formula (VII), compounds of formulae (VIIa) and/or (VIIb)

10



15



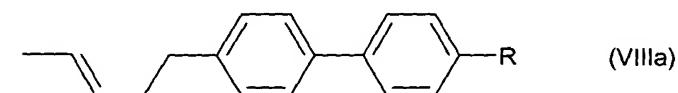
in which

R is an alkyl radical having 1-7 carbon atoms; and

20

e) as compounds of formulae (VIII), (IX) and/or (X), one or more of the compounds of formulae (VIIa), (IXa), (IXb) and (Xa)

25

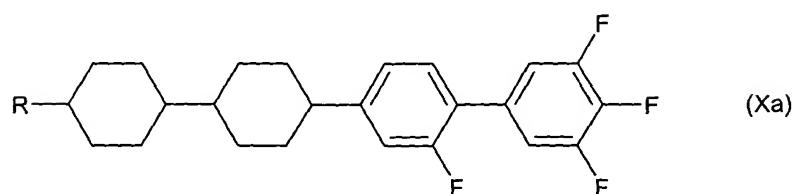
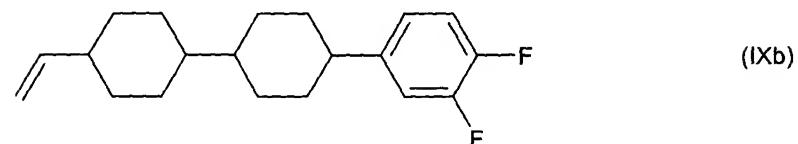
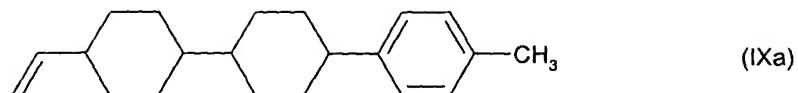


in which

30

R is an alkyl radical having from 1 to 7 carbon atoms,

35



in which

15 R is an alkyl radical having 1-7 carbon atoms.

20 11. A liquid-crystalline medium according to Claim 10, consisting
essentially of compounds of the formulae

25 a) (I)
 b) (IIe) and/or (IIg)
 c) (Vla)
 d) (VIIa) and/or (VIIb)
 e) (VIII), (IXa), (IXb) and/or (Xa).

30 12. A liquid-crystalline medium according to Claim 11, consisting
essentially of:

35 a) 1 - 50% by weight of one or more compounds of the formula
 (I),
 b1) 5 - 50% by weight of one or more compounds of the formula
 (IIe),
 b2) 5 - 50% by weight of one or more compounds of the formula
 (IIg),
 c) 0 - 30% by weight of one or more compounds of the formula
 (Vla),

- d) 0 - 20% by weight of one or more compounds of the formulae (VIIa) and/or (VIIb),
- e1) 0 - 40% by weight of one or more compounds of the formula (VIIIa),
- 5 e2) 0 - 40% by weight of one or more compounds of the formulae (IXa) and/or (IXb), and
- e3) 0 - 25% by weight of one or more compounds of the formula (Xa).

10 13. A liquid-crystalline medium according to Claim 12, consisting essentially of:

- a) 5 - 50% by weight of one or more compounds of the formula (I),
- 15 b1) 10 - 40% by weight of one or more compounds of the formula (IIe),
- b2) 10 - 40% by weight of one or more compounds of the formula (IIg),
- c) 2 - 20% by weight of one or more compounds of the formula (VIa),
- 20 d) 2 - 15% by weight of one or more compounds of the formulae (VIIa) and/or (VIIb),
- e1) 5 - 20% by weight of one or more compounds of the formula (VIIIa),
- 25 e2) 5 - 30% by weight of one or more compounds of the formulae (IXa) and/or (IXb), and
- e3) 2 - 20% by weight of one or more compounds of the formula (Xa).

30 14. In electro-optical display element containing a liquid-crystalline medium, the improvement wherein said medium is according to one of Claims 1 to 13.